

Signal Sketches Summary

You said:



Sketch the following signals:

- a) $\text{rect}(t+1)/4$
- b) $5\text{ramp}(0.1t)$
- c) $(t-1)u(t-1)$
- d) $-u(t-1)$
- e) $u(t-2) - u(t-2)$

ChatGPT said:



Let's break down the signals one by one before sketching:

a) $\frac{1}{4}\text{rect}(t+1)$:

- $\text{rect}(t+1)$: This is a rectangular pulse centered at $t = -1$ with a width of 1.
- $\frac{1}{4}$ scales the amplitude by 1/4.

b) $5 \times \text{ramp}(0.1t)$:

- $\text{ramp}(t)$: This is a ramp function that increases linearly with t (i.e., t for $t \geq 0$ and 0 for $t < 0$).
- $0.1t$ scales the argument, making the ramp function increase more slowly.
- **5** scales the amplitude by 5.

c) $(t-1)u(t-1)$:

- $u(t-1)$: This is a step function that activates at $t = 1$.
- $t-1$: This linear term starts increasing from 0 at $t = 1$.

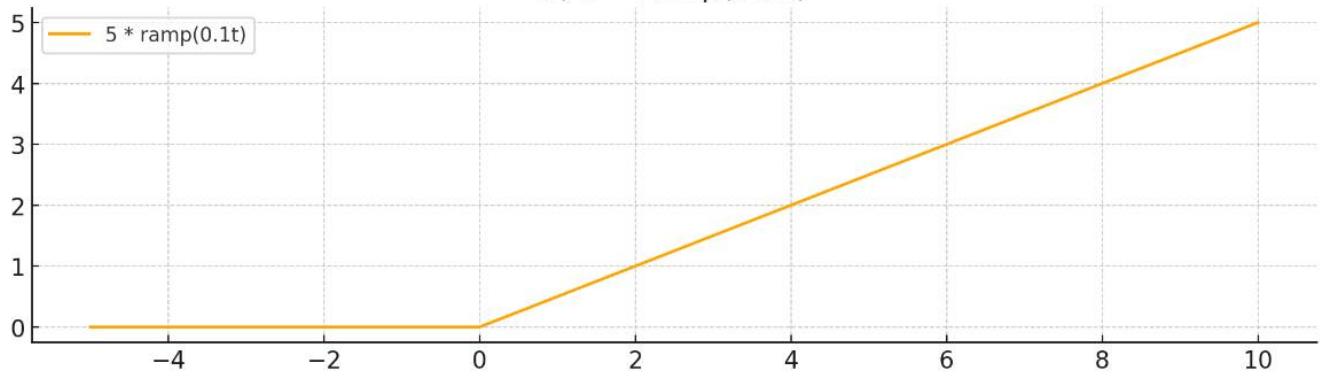
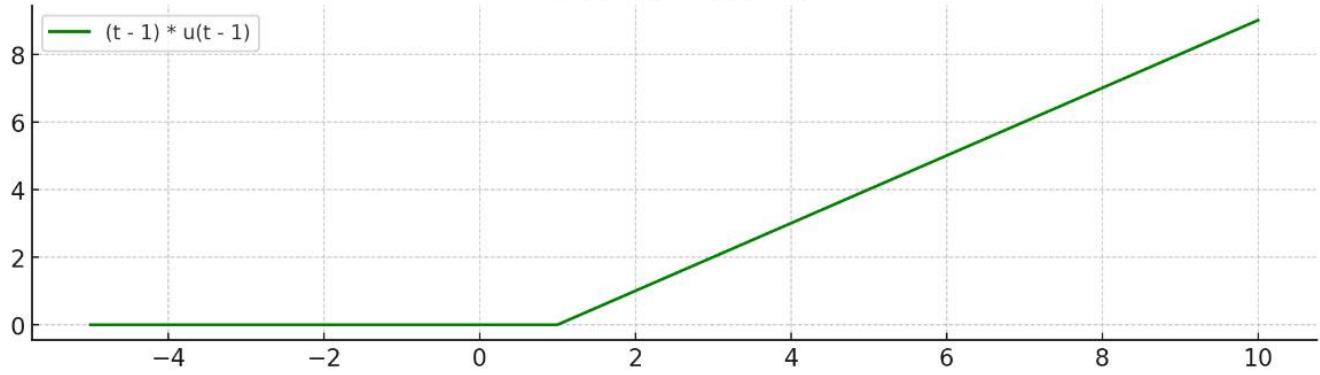
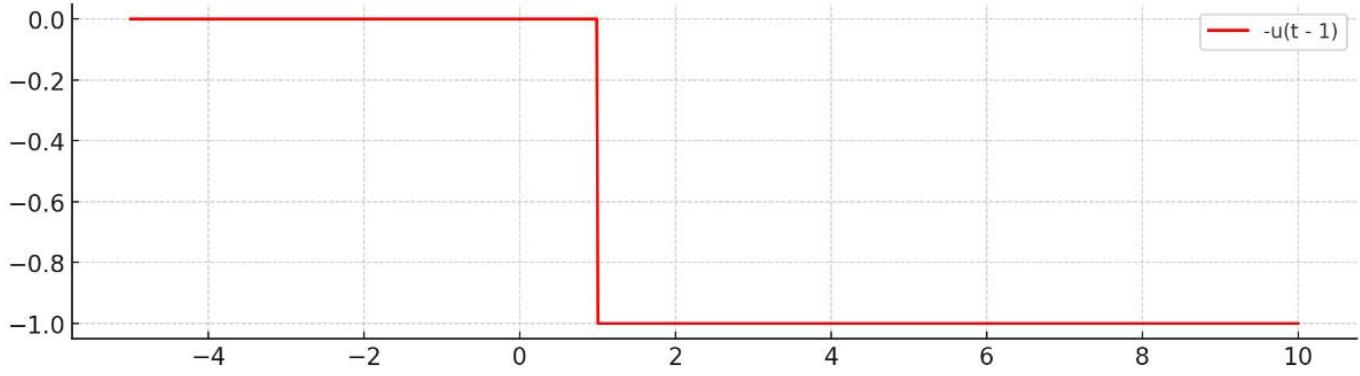
d) $-u(t-1)$:

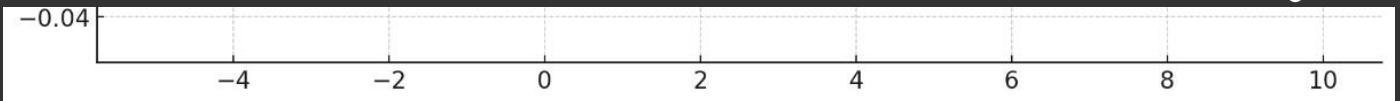
- $u(t-1)$: This is a step function that activates at $t = 1$.
- $-u(t-1)$: This inverts the step function, making it a negative step that starts at $t = 1$.

e) $u(t-2) - u(t-2)$:

- This expression simplifies to 0 since $u(t-2) - u(t-2) = 0$ for all t .

Given these descriptions, I'll now sketch these signals.

a) $(1/4) * \text{rect}(t + 1)$ b) $5 * \text{ramp}(0.1t)$ c) $(t - 1) * u(t - 1)$ d) $-u(t - 1)$ e) $u(t - 2) - u(t - 2)$ 



Here are the sketches for the given signals:

- $\frac{1}{4} \times \text{rect}(t + 1)$: A rectangular pulse centered at $t = -1$ with a height of 0.25.
- $5 \times \text{ramp}(0.1t)$: A ramp function starting from 0 at $t = 0$, increasing linearly with a slope of 0.5.
- $(t - 1) \times u(t - 1)$: A linear function starting from 0 at $t = 1$, increasing with a slope of 1.
- $-u(t - 1)$: A negative step function that activates at $t = 1$, remaining constant at -1 for $t \geq 1$.
- $u(t - 2) - u(t - 3)$: This simplifies to 0 for all t , so it is just a flat line at 0.

You said:



Sketch the signal, $y[n] = u[n+2] - u[n-3]$, where $u[n]$ represents unit step signal

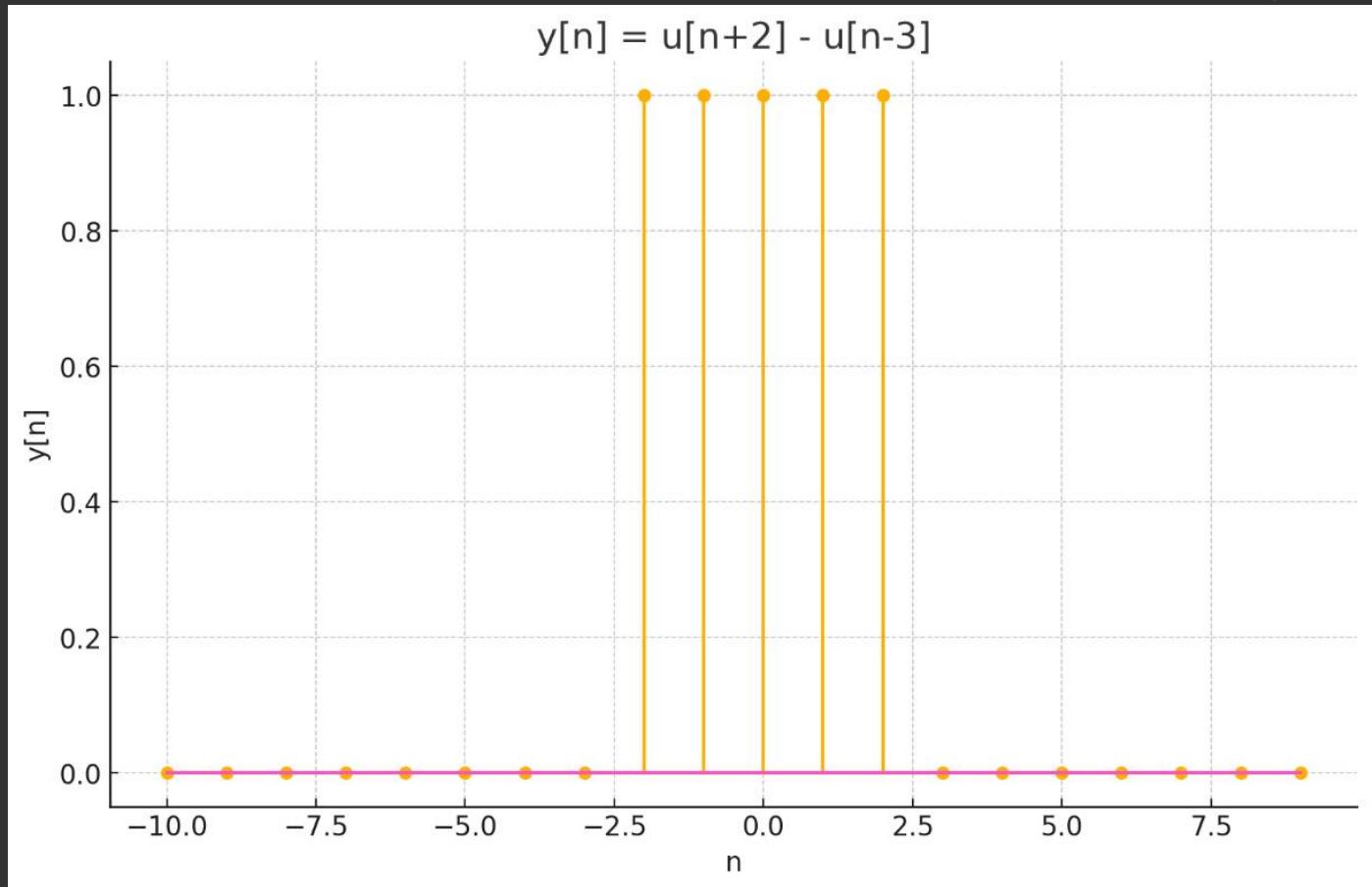
ChatGPT said:



The signal $y[n] = u[n + 2] - u[n - 3]$ is a difference of two unit step functions. Let's break down and sketch the signal:

- $u[n + 2]$ is a unit step function that shifts the step to $n = -2$. It is 0 for $n < -2$ and 1 for $n \geq -2$.
- $u[n - 3]$ is a unit step function that shifts the step to $n = 3$. It is 0 for $n < 3$ and 1 for $n \geq 3$.
- The difference $u[n + 2] - u[n - 3]$ results in a signal that is 1 between $-2 \leq n < 3$ and 0 otherwise.

I'll now sketch this signal.



Here is the sketch of the signal $y[n] = u[n + 2] - u[n - 3]$:

- The signal is 1 between $n = -2$ and $n = 2$ (inclusive), and 0 elsewhere.
- This creates a rectangular pulse that starts at $n = -2$ and ends just before $n = 3$.

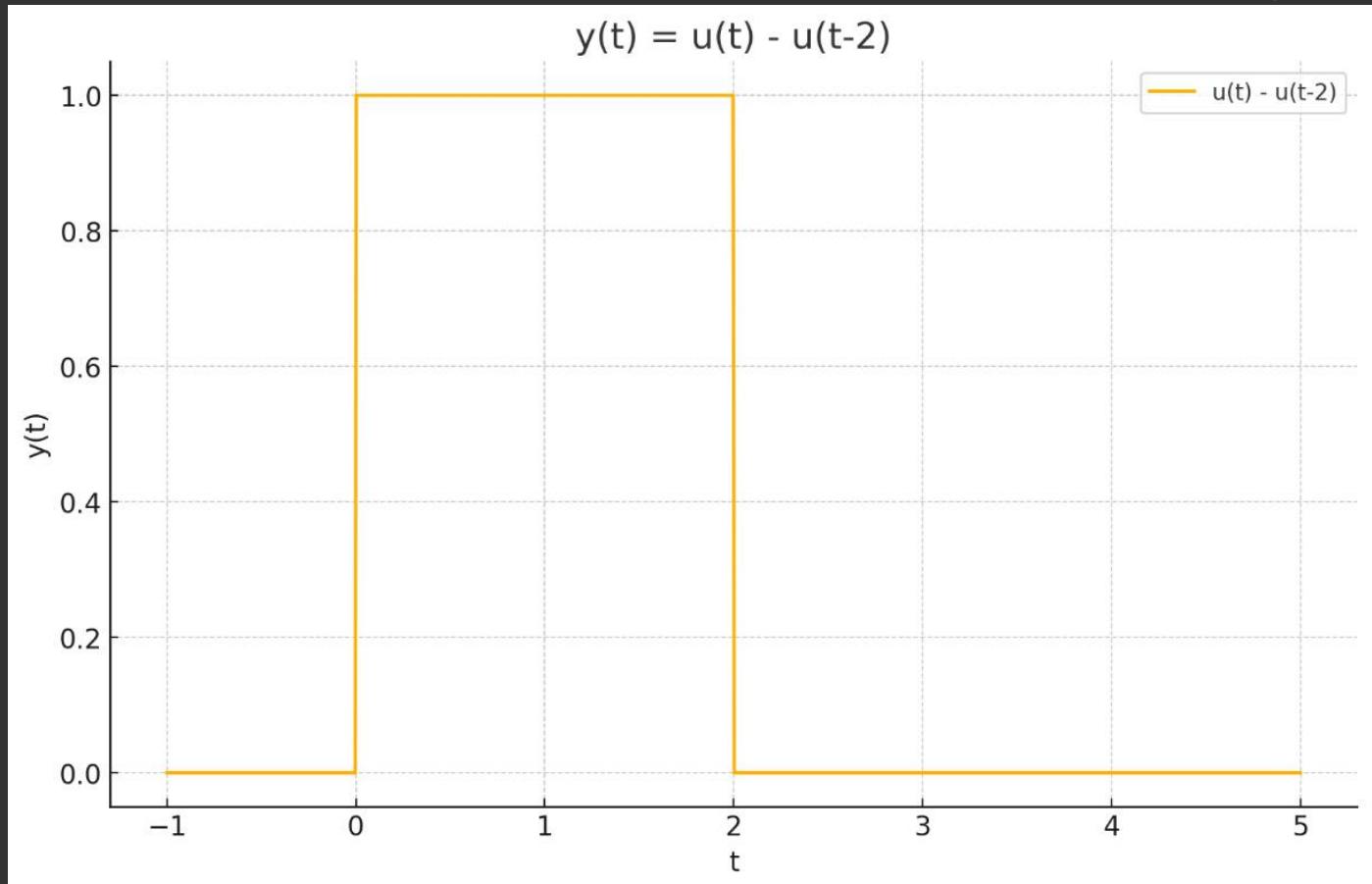
You said:



Sketch the following signal
 $u(t) - u(t-2)$

ChatGPT said:





Here is the sketch of the signal $y(t) = u(t) - u(t - 2)$:

- The signal is 1 between $t = 0$ and $t = 2$, and 0 elsewhere.
- This creates a rectangular pulse that starts at $t = 0$ and ends at $t = 2$.

ChatGPT can make mistakes. Check important info.